

MANAGEMENT INFORMATION SERVICE

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FINANCING THE SEWER SYSTEM

What are the bases for sewer service charges? How do cities pay for sewer extensions? Why are sewer connection charges used, and how are they levied?

The 1961 *Municipal Year Book* provides statistical data on sewage systems for 689 cities over 10,000 population (pp. 323-338). The data cover type of facilities, sewer service charges, summer use charges, average monthly residential charge, sewer charges outside the city, use of sewer revenue, sewer connection charges, and methods of financing sewer laterals in new subdivisions and in older, built-up areas.

Management Information Service has received a number of requests for information on how cities are financing sewage systems. The purpose of this report is to expand upon the data in the *Year Book*, particularly with respect to (1) sewer service charges, (2) financing sewer extensions, and (3) sewer connection charges.

Sewer Service Charges

Data gathered for the 1961 *Municipal Year Book* show that 61 per cent of the cities over 10,000 population have a sewer service charge (420 out of 689 reporting). This compares with less than 20 per cent of the cities in 1945. This growth, although substantial, is not as great as might be expected. A charge for the use of the sewer system was first adopted by Brockton, Massachusetts, in 1894. With most cities looking for sources of revenue one might suspect that close to 100 per cent of the cities would have such a charge by now.

Probably the reason that 39 per cent of the cities over 10,000 still do not have sewer service charges is that traditionally the sewer system was not considered a public utility. Maintenance and operation costs were met from general taxes. Contrast this with the concept of water systems which have always been considered as public utilities.

But the sewer system is a utility because it is like a business enterprise. It is an essential community service not subject to competition, and the use of the service is measurable. Equitable financing of a sewage system requires that the user pay for the service. Acceptance of this principle is the foundation for development of an adequate rate schedule.

Use of Sewer Revenue

A number of state laws and local ordinances restrict the use of sewer service revenue to specific items of expense for the sewer system. Of the 428 cities reporting to the *Year Book*, the great majority use the revenue to operate the treatment plant and to maintain the sewer lines. Seventy per cent of the cities also use sewer service charge revenue to construct the treatment plant or to retire revenue bonds issued to finance said construction. Fewer cities use the revenue for construction of sewers: 211 for trunk and interceptor sewers, and only 125 for sewer laterals. The reason that few cities construct sewer lines from sewer revenue is that extension policies have established other methods of financing. (See section below on "Financing Sewer Extensions.")

Bases of Sewer Service Charge

The development of a rate schedule is a technical matter which is discussed in detail in

Fundamental Considerations in Rates and Rate Structures for Water and Sewage Works. This publication should be consulted before revising or adopting a sewer service charge. It was prepared by a committee composed of representatives of the American Society of Civil Engineers, the section on municipal law of the American Bar Association, American Water Works Association, National Association of Railroad and Utilities Commissioners, Municipal Finance Officers Association, Water Pollution Control Federation (formerly the Federation of Sewage and Industrial Wastes Associations), American Public Works Association, and Investment Bankers Association of America. It is available from MIS on loan.

The basic principle in charging for sewer service is that total revenue should cover all costs (operating expenses, depreciation, and debt principle and interest), and costs should be met by both users and nonusers. Sewer system costs are caused by the property as well as by the use. The nonuser charge should be based on assessed value of property, and the user charge on a measure of use.

Several examples will illustrate why nonusers should pay their share of the cost of the operation of a sewerage system. Where a city has combined sewerage system, part of the sewer use is to dispose of storm water runoff from individual properties. Thus part of the use of the sewer is not for sewage alone. Another example is the sewage treatment plant. Part of the sewage treatment equipment, such as screens and grit tanks, is needed mainly to remove debris brought into the plant by storm water. This principle of charging nonusers has been adopted by only a few jurisdictions. Those jurisdictions with a nonuser charge that reported to MIS are the East Bay Municipal Utility District serving the Oakland, California, area; and the Buffalo (New York) Sewer Authority.

Water Consumption. The 1961 *Municipal Year Book* survey asked each city to indicate the basis for sewer service charges for residential properties. Almost 50 per cent of the cities indicated that water consumption was the basis for the charge.

The most equitable method would be to meter sewerage. This is impractical, however, because there is no inexpensive and adequate sewage meter available. Therefore cities generally have adopted water consumption as a reasonable measure of the amount of sewage discharged from any one household or industrial or commercial establishment.

Cities that use water consumption usually charge in three different ways.

1. A rate may be set directly by water consumption. Such a rate is in addition to the water charge. The Oak Park, Illinois, sewer rental ordinance illustrates this approach. Its monthly sewer service charge is \$1.50 up to and including 9,000 gallons of water; \$1.75 for 9,001 to 15,000 gallons; \$2.50 for 20,001 to 30,000 gallons; and so on.

2. A variation is the unit rate. The Cincinnati ordinance provides that monthly sewer service charges shall be as follows: 6.0 cents per 100 cubic feet of water for the first 60,000 cubic feet; 5.4 cents for 100 cubic feet for the next 404,000 cubic feet, and so on. In addition to the unit rate the city has a minimum charge per billing based on the size of the meter: 72 cents for a five-eighths-inch meter; 90 cents for a three-fourths-inch meter; \$1.08 for a one-inch meter. Most of the large cities use this system because it measures reasonably accurately the use of the facility.

3. A third approach is to base the charge on a percentage of the water bill. Two methods are frequently used. The first is illustrated by the Philadelphia ordinance which provides:

<u>Size of Water Meter</u>	<u>Percentage</u>	<u>Size of Water Meter</u>	<u>Percentage</u>
5/8 inch	98	3 inch	68
3/4 inch	93	4 inch	62
1 inch	88	6 inch	57
1 $\frac{1}{4}$ inch	83	8 inch	51
1 $\frac{1}{2}$ inch	78	10 inch	51
2 inch	73	and larger	

A second approach is illustrated by Fort Pierce, Florida. A graduated percentage is applied based on water consumption: 40 per cent of the charge for the first 40,000 gallons of water used, 35 per cent of the second 40,000 gallons, and 30 per cent of the third 40,000 gallons.

Flat Rate. The second most popular method of charging for sewer service is the flat rate which simply states that there will be a sewer service charge, as in Anaheim, California, for example, of \$1.25 per month for each dwelling unit in a single family dwelling, duplex, double house, or apartment house. With the flat rate different types of property uses usually have a different rate. A number of cities use the flat rate for residential properties and water consumption for industrial and commercial properties.

The flat rate has one advantage — simplicity, and it probably is equitable for many single-family and duplex dwellings. In most cases a flat rate can be established on the basis of average residential consumption.

Other Methods. A few cities use other bases for sewer service charges, but these have been disappearing rapidly even for residential use. Other bases used are number of plumbing fixtures and type of property served. These bases have been disappearing because they do not measure sewer usage. The *Year Book* survey showed only 47 cities using some system other than flat rate or water consumption.

The sewer service charge based on the number of fixtures is illustrated by one typical ordinance. For one-family, two-family, and three-family residences, the monthly charge for each family unit runs from 75 cents per month for one to four fixtures to \$1.85 for 20 fixtures. It can easily be shown how inequitable this type of charge can be. Contrast an elderly couple living in a large home with a number of fixtures with a family of six living in a medium-sized home with fewer fixtures. There is little doubt that the family of six will use the sewer a great deal more.

Frequently those cities using the number of fixtures as a base for residential property will use the type of property for setting other charges. For instance, the Waco, Texas, ordinance has a charge for apartment houses, hotels, and boarding houses that is different from the residential schedule. Waco also has separate schedules for packing plants, laundries, and bottling works.

Combined Rate. A few cities combine the waterworks and sewerage system into a single operation under one department and use combined rates. Fort Worth, Texas, illustrates this approach (see Figure 1). The city also has rate schedules for those persons using only one of the two services.

Combining the operation of water and sewer services makes sense in that they are similar. Both systems have treatment plants and distribution mains. Both are utilities. However, it would seem that the combined rate does not gain much. With modern billing equipment it is simple to bill both a sewer and water rate on the same bill. This provides an easy segregation of revenues to allow the city to know financially whether water revenue is carrying the sewer system or sewer revenue is carrying the water system.

Special Problems

Surcharges. Industrial wastes often present special problems and require surcharges to cover disposal costs. If industrial wastes have a high biological oxygen demand and concentration of suspended solids, larger facilities usually are needed for the treatment of such sewage. Or the city must require the industry to pretreat the waste. Thus many cities make a special charge above and beyond the normal sewer service charge. A good discussion of this problem is found in a special report of the American Public Works Association entitled *Guidelines for Drafting a Municipal Ordinance on Industrial Waste Regulations and Surcharges* (August, 1959. \$3).

Three methods of making a surcharge are frequently used: a special water consumption rate, a special flat rate, and a special rate above the normal rate based on the quality and quantity of sewage.

The Cincinnati method is one of the most precise. The sewer charge rate per 100 pounds of biological-oxygen demand is established at \$1.25 and per 100 pounds of suspended solids at \$1.05.

The sum of these two surcharges added to the basic sewage service charge produces the total charge imposed on the industry.

Outside Sewer Service Charges. Many cities providing sewer service to properties located outside the city have special rates that are charged directly to the property owner. Of the 220 cities indicating that they provide sewer service direct to the property owner outside the city (as contrasted with service on a contract basis with another governmental jurisdiction), 183 cities increase the rate from 10 to 150 per cent of the city rate. Of the 183 cities, 47 increase the rate by 50 per cent and 55 cities double the rate. The desirability of extending sewer lines and offering direct service to customers outside the corporate limits is discussed below under "Financing Sewer Extensions."

Summer Adjustment of Rates. One of the objections raised against the water consumption as a base for sewer service charges is that all the water does not go down the sewer. In industrial and commercial uses the water that is used for processing can be separately metered.

During the summertime residential water use increases because of lawn sprinkling and car washing. Much of this water is not discharged into the sewer. People frequently feel that the sewer service charge should not reflect the use of this water. Therefore 100 out of the 243 cities using water consumption as the base reported that an adjustment in the service charge is made during the summer months to compensate for water used in sprinkling, car washing, and other outdoor uses. Most of the cities making an adjustment do so on the basis of winter water consumption. In other words, the June-July-August bill or the July-August-September bill is based upon water consumption in January, February, and March or November, December, and January.

Few of the large cities make such adjustments. Their studies indicate that increased water consumption during the summer is due to a number of factors. Some of these factors, such as increased baths, contribute sewage to the system. The rate structure should be based on total revenue needed. If summer bills are based on winter consumption, then the winter rate will have to be higher to compensate.

Financing Sewer Extensions

A number of cities have adopted formal policies for financing sewer line extensions. Formally adopted extension policies provide a guide for city councils and officials in determining whether a particular extension should be made and establishes beforehand the city's and the property owner's responsibilities for financing the extension.

Several problems are involved in the development of sound extension policies. First is the problem of how to finance the extension of sewers in the built-up areas of the city. Second is the problem of financing sewer construction in subdivisions. Third is the problem of developing a policy concerning the extension of sewer lines outside the city limits.

In all these areas the policy must be concerned with three types of sewers: laterals, trunks, and interceptors. Lateral sewers, for the purpose of this report are those sewers that serve the residential street. They are usually 8 inches in size. Trunk sewers are sewers that collect sewage from a system of laterals within a particular area of the city. Interceptor sewers are large trunk sewers that collect sewage from the whole city or major area of the city and take it to the treatment plant.

Extensions in Older, Built-up Areas

Laterals. Data collected for the 1961 *Municipal Year Book* show that cities use four basic methods of financing the construction of sewer laterals. These are as follows:

1. Special assessments are used by the overwhelming number of cities (500 out of 666 reporting). Special assessments are frequently used because they provide an equitable means of financing in that the property owner is receiving a *direct* benefit that he should pay for.

When a city finances the construction of lateral sewers by special assessments it faces the policy question of whether the city should share in the cost of construction. Theoretically, the city should share only in relationship to the general benefit that the city at large receives. In the case

Rates for Water & Sewer Service Effective March 1, 1960

A monthly minimum service charge shall be made each month or fraction thereof for each connection with the City water mains. The service charge shall be made based on the size of the meter and the living units connected as follows:

<u>Meter Size</u>	<u>Monthly Minimum Charge</u>	<u>Meter Size</u>	<u>Monthly Minimum Charge</u>
3/4" or less	\$ 1.65	6"	\$ 80.00
1"	3.35	8"	130.00
1 1/2"	6.65	10"	165.00
2"	10.00	12"	325.00
3"	21.00		
4"	42.00		

1. An amount of water at rates in effect will be allowed monthly for the monthly minimum service charge.
2. In all cases where more than one unit is supplied through one meter, a minimum charge will be made for each unit supplied.
3. All water used outside of city limits will be charged double the city rate.

MONTHLY WATER RATES

<u>First</u>	<u>Cubic Feet</u>	<u>Rate</u>	<u>Next</u>	<u>Cubic Feet</u>	<u>Rate</u>
	200	\$1.65	40,000		.243 per 100 cu. ft.
Next	1,000	.317 per 100 cu. ft.	43,333-1/3		.201 per 100 cu. ft.
Next	2,000	.295 per 100 cu. ft.	133,333-1/3		.159 per 100 cu. ft.
Next	5,000	.285 per 100 cu. ft.	Over 266,666-2/3		.117 per 100 cu. ft.
Next	41,800	.274 per 100 cu. ft.			

<u>Cubic Feet</u>	<u>Rate</u>	<u>Cubic Feet</u>	<u>Rate</u>
200	\$ 1.65	60,000	\$ 163.80
400	.317 2.28	70,000	.243 188.10
800	3.55	80,000	212.40
1,200	4.82	90,000	236.70
1,600	6.00	100,000	256.80
2,000	7.18	110,000	276.90
2,400	.295 8.36	120,000	.201 297.00
2,800	9.54	130,000	317.10
3,200	10.72	133,333-1/3	323.80
4,000	13.00	150,000	350.30
5,000	15.85	200,000	.159 429.80
6,000	.285 18.70	250,000	509.30
7,000	21.55	266,666-2/3	535.80
8,000	24.40	300,000	574.80
8,200	24.97	400,000	691.80
9,000	27.16	500,000	808.80
10,000	29.90	533,333-1/3	847.80
15,000	43.60	800,000	1,159.80
20,000	57.30	1,000,000	.117 1,393.80
25,000	.274 71.00	2,000,000	2,563.80
30,000	84.70	3,000,000	3,733.80
35,000	98.40	4,000,000	4,903.80
40,000	112.10	5,000,000	6,073.80
45,000	125.80	7,000,000	8,413.80
50,000	139.50	10,000,000	11,923.80

Figure 1 — Sewer and Water Combined Charges, Fort Worth, Texas

of laterals, it is often argued that the total benefit is derived by the individual property and therefore the property owner should be required to pay the total cost. Over 50 per cent (292) of the 500 cities assessing the construction of sewer laterals adhere to this philosophy.

On the other hand the remainder of the cities (208) follow a policy of sharing in the cost of sewer lateral construction. The argument advanced for such a policy is that there is a general public health benefit to the city at large. It is argued that septic tank disposal systems and other private disposal systems are never completely satisfactory in most urban areas. Ground conditions are frequently not conducive to private systems. Population densities eliminate effective private disposal because the ground can become saturated.

When a city shares in the cost of construction it does so in one of several ways. First, it can establish a flat percentage that it will contribute to the project. Second, it can assume the legal, engineering, and administrative costs. Finally, it may assume part or all of the cost for specified items such as intersections or restoration of the street.

A second problem involved in financing sewer laterals by special assessment is the question of who initiates the project. Historically many special assessment laws required that the majority of property owners or the persons owning the majority of the front footage must agree to the project. However, particularly in the case of sewers, it was found that such a policy hampered the city in correcting public health and other problems. Today most policies provide that the city can initiate the project if it deems it desirable.

A third question arises as to how the cost that is to be assessed should be spread against the property. A detailed discussion of the methods of levying assessments is beyond the scope of this report. Management Information Service has loan material available in this area. Further the *1959 Municipal Year Book*, pages 211-229, has material on special assessments. A brief summary of the problems is presented.

In general only those properties which can connect directly to a sewer should be required to pay for it, and an individual should not pay for more than one lateral. Therefore extension policies quite frequently contain a statement such as that of Lexington, Massachusetts: "No land shall be taxed or assessed hereunder more than once. No assessment hereunder shall be levied upon any estate or part thereof which by reason of its grade or otherwise cannot be drained into such new construction until such incapacity has been removed. No assessment shall exceed the amount of the special benefit to the estate assessed."

The most popular method is to assess the cost on a front-foot basis. In other words each property owner pays a sum equal to the number of front feet he has facing the sewer times the unit foot cost of the project. Other methods that have been used to assess the cost of sewers against property are the area and assessed valuation of the property. When the assessment is based on area it is similar to the front-foot assessment in that a unit cost is developed on the basis of square foot. Incidentally, cities using the front-foot basis often will assess irregularly shaped lots on the basis of area.

Stratford, Connecticut, and other cities have developed a system of levying assessments on the basis of a lot unit. The lot unit is based on minimum standards for lot size in the area. All lots that cannot be subdivided into additional lots are assessed the same. This particular method of assessing is interesting because it appears to have a direct relationship to the value received. When the assessment is based on the number of feet, area, or assessed valuation there is not complete equity among payments by property owners. For instance, the person with a 60-foot lot does not receive any more benefit than does a person with a 50-foot lot.

2. The second method of financing costs of lateral construction is to establish a fixed charge per foot that will be paid by the property owner. This frequently is done through special assessments. It is also done in some cities through legal agreements between property owners and the city and sewer connection charges as discussed below. Wichita Falls has developed a policy that illustrates the use of the fixed amount per front foot. Their policy reads as follows:

The city of Wichita Falls may extend water and sanitary sewer mains in the streets and alleys, or easements, within the city limits of the city of Wichita Falls in order to permit connections by persons desiring and

seeking water service and sanitary sewer service. A charge, which shall be known as the pro rata charge, shall be made against each lot or tract of land, and the owner thereof, whose water or sewer lines shall be hereafter connected with any water main or sanitary main of the city of Wichita Falls and the charge shall be at the following rates which rates are a portion of the total cost of such water and sewer mains...\$1.60 per front foot of the lot or tract of land to which the sanitary sewer connections may be made.

This policy requires the payment of a certain sum of money when a piece of property is connected. This type of charge is also considered a connection charge by some cities. (See the following section on "Connection Charges.")

Big Springs, Texas, has a similar policy for the extension of sanitary sewers, but it provides an alternate policy where only one property owner is involved. If the sewer extension is short, the city will extend the sewer when the property owner has deposited the pro rata cost of the sewer for the total length of the extension. When any property for which such person has advanced the pro rata cost is connected to the extension, the pro rata cost so advanced on that particular property shall be refunded by the city to the person making the original deposit.

3. A third method of financing the extension of sewer laterals is to extend for a maximum number of feet at city cost. Ten cities, eight of which are located in Texas, reported this procedure to the *1961 Municipal Year Book*. Fort Worth, Texas, policy clearly illustrates this procedure:

Where it is necessary to extend the sewer line to serve a new single customer the city at its own expense will extend said sewer up to 100 feet. If a greater distance than 100 feet should be required to extend a line to the nearest property line of the customer, said single customer shall pay excess over the 100 feet allowed at the rate of \$2.50 per lineal foot. If more than one single customer is served by the main extension, 100 lineal feet of sewer will be allowed for each single customer thus served, and any excess footage will be paid for at the \$2.50 per lineal foot rate. No more than one single customer credit of 100 feet will be allowed for each lot or tract of records so served regardless of the number of buildings occupied or otherwise which may be located on said lot or tract....

In the case of older built-up areas where there are numerous prospective single customers, sewer lines will be extended on the 100 foot per single customer basis, provided such customers living within the area group themselves together and act through a committee of not more than five citizens of the area and authorize said committee to carry on in their behalf all negotiations with the city on all matters pertaining to the sanitary sewer installation... No construction shall begin until all monies due have been paid to the city. [The Fort Worth policy is printed in full in Appendix A.]

4. A final method is to extend sanitary sewer laterals at city cost. A substantial group of cities follow this policy: 131 out of the 660 reporting cities. Interestingly enough, only 47 of these cities use sewer service charges to finance this construction. The other cities either use general tax monies or sewer connection charges as discussed below.

Trunk and Interceptor Sewers. City policies on trunk and interceptor sewers for older, built-up areas of the city are difficult to determine. In many cases these sewers have been constructed for a number of years. Present officials are not sure how such sewers were financed. Also, many such sewers were constructed under federal public works funds during the depression of the 1930's.

However, from information gathered and reading the sewer extension policies of a number of cities it is safe to state that the great percentage of cities pay for the construction of interceptor sewers. Policies vary for trunk sewers, but the majority of cities at least pay a portion of the cost. The methods of financing trunk line sewers are similar to those for lateral sewers.

A few cities do assess the total cost of the trunk line sewer. Kansas City, Missouri, follows this policy. Districts are established based on the area that will be served by a trunk line. Costs of the trunk line are spread over the entire district based on some unit of cost. In the case of Kansas City it is a square foot. The district can be divided into areas to further distribute the cost equitably.

When the city shares in the cost of the construction of a trunk line, it is most frequently done in one of two ways — on a percentage basis or by the city assuming the difference in cost between what a lateral sewer costs and the trunk line cost. In other words the trunk line is assessed as a lateral sewer against the abutting property owners only (not over the entire district served by the

trunk line) and the city pays the extra cost. The reason for this approach is that the trunk line sewer is necessary for the sewer system, and it can strongly be argued that there is a general public benefit.

Subdivisions

The extension of sewer laterals, trunk lines, and interceptors for new subdivisions has provided a problem to many cities of all sizes. The survey for the *1961 Municipal Year Book* conclusively shows that the great majority of cities in all population groups require the developer to put in sewer laterals, trunk lines, and interceptors at his own expense when such sewers serve his own subdivision (532 out of 673 reporting cities). Seven cities indicated that the subdivider was initially required to put in such sewers but over a period of time the total cost or a portion of the cost was rebated by the city as revenues were collected from sewer service charges. The problems connected with the financing of sewers for new subdivisions relate primarily to oversized facilities and off-site mains.

Oversized Facilities. Often a subdivider will be required to install a sewer larger than is needed to serve his subdivision because of possible future development of land beyond his subdivision. The question then arises: Should the subdivider or the city pay the cost differential for the oversized sewer? Certainly the developer should pay at least for that portion of the sewer that would normally be required for his subdivision.

The person who develops the land beyond the subdivision should pay a portion of the cost of the sewer. Since such a development will not take place immediately, some cities will pay the cost of the oversized facility, recouping the expense when the land beyond the original subdivision is developed. If the city is experiencing a lot of development this procedure can put a drain upon the cash position of the city. Therefore, some cities require the developer to pay for the initial cost of all sewers within subdivisions but will rebate a portion of the cost of the oversized sewer to the developer when the land beyond the original subdivision is developed. The city collects this rebate from the new developer. Generally cities following this policy set a time limit for the land beyond the original subdivision to be developed, usually five to 10 years.

San Antonio follows another method of participating in the cost of oversized facilities. The city requires the developer to install all mains initially. When the developer has satisfactorily completed the construction of oversized facilities, the city immediately rebates a portion of the cost based on a refund schedule set forth in the sewer extension policy ordinance. The rebate schedule is developed on the basis of the size of the main that would be required for the developer's land. The rebate schedule is reproduced in Figure 2.

Approach Sewer Lines. The city faces the problem of determining who will pay for an approach main when one is necessary. Sometimes the subdivision is not next to an already existing sewer; therefore, a main must be constructed from the existing sewer line to the site of the new subdivision.

There are several situations that affect how a city may desire to have such a facility financed. First, the proposed subdivision requiring an approach main may be a premature development. The city may not be interested in encouraging its development and may require the developer to pay for the total approach sewer. On the other hand, the city may desire to encourage the development even though the land between the subdivision and the existing sewer system may not be suitable for development, and the subdivider may not feel it economical for him to pay the full cost of the approach sewer.

The area between the existing sewer and subdivision may need sewers now or in the future. Therefore the developer may be required to put the facility in, but if connections are made in the future, the city rebates a portion of the cost. The city also may decide to share in the cost if there is a general benefit. Since a portion of the total approach main is made necessary by the proposed development, the developer should be required to pay a portion of the off-site sewer.

One final word. Rebating the cost of oversized facilities when they are used is of doubtful legal validity in some states. Therefore a city should check carefully what state law will allow.

Size of Main Adequate To Serve Developer's Land	Main Installed	Repayment Amount (per linear foot)	
		Concrete	Clay
8 "	10 "	\$0.14	\$0.22
8 "	12 "	\$0.75	\$0.95
8 "	15 " or larger	Contract price or agreed price less	Contract price or agreed price less
		\$1.18	\$1.33
10 "	12 "	\$0.61	\$0.73
10 "	15 " or larger	Contract price or agreed price less	Contract price or agreed price less
		\$1.32	\$1.55
12 "	15 " or larger	Contract price or agreed price less	Contract price or agreed price less
		\$1.93	\$2.28

Figure 2 — San Antonio's Oversized Sewer Repayment Schedule

It may be necessary initially to share in the cost of the oversized or approach main and charge the new developer a large sum of money commensurate with his share of the cost of the sewer when he connects.

Extensions Outside the City

Cities often are faced with requests to extend sewer services outside their city limits, and a number of cities have done so under a variety of conditions. On the other hand, some cities have adopted a policy of extending no sewers beyond the city limits unless the area affected is willing to annex and become part of the city. The reason for such a stringent policy is obvious: the city does not wish to extend city services to an area that is not paying property taxes. When cities do extend their sewer lines, and make a sewer service charge, the charge usually is higher, as previously noted. However, those cities that do not make a sewer service charge and have extended the mains beyond the corporate limits, will make an annual or monthly service charge for the use of the sewer to outside users.

Management Information Service Report No. 104, *Intermunicipal Arrangements for Sewerage Service*, September, 1952, contains some very good suggestions for a policy for a city to follow in extending sewer mains. These suggestions are:

1. A statement that connections to the city sewer system will be made only in the interest of the health, welfare, and safety of the people in the city. Connections will be made only if the city's sewage disposal system is adequate to handle the increased load. Plans and specifications of the connecting system must meet all city requirements.
2. The chief administrative officer should be authorized to enter into contracts with individual property owners in accordance with the policies established by the city council. The council should ratify all contracts with large private users and with governmental units.
3. The city council reserves to itself the right to set rates to be charged for such services and the power to change rates at its own discretion upon due notice and hearing.
4. Plans and specifications for the connecting systems should be reviewed by the city to determine that all design features conform to city regulations. The city should inspect construction to check conformance.

5. The city should reserve the right, after due notice and hearing, to terminate any contracts when it determines that the best interests of the city are not being served. The city should be able to terminate contracts immediately for nonpayment of charges.

6. The city should retain complete control over the connecting system and have the privilege of permitting additional users to connect to the system; such portions of the connecting line as designated by the public works director must become the property of the city for operation and maintenance.

7. All construction, engineering, inspection, and incidental costs incurred in constructing the connection should be borne by the grantee. The grantee should also pay all subsequent maintenance and repair costs.

8. The city may adopt a policy of reimbursing an original grantee as new connections are made to a line serving his property.

9. Any requirement referring to specific users should be included in detail. For example, it may be necessary to require pretreatment of certain industrial wastes, to limit the number of connections for a commercial establishment, or to set a limit on the amount of wastes which a connecting governmental unit may discharge into the city's system. Special rate schedules may be established for industrial, commercial, and residential users. When another governmental unit contracts for disposal of its sewage, that unit itself may be made responsible for collection and payment of charges.

Traverse City, Michigan, has developed an interesting policy for providing utility services beyond the city limits. The city's policy provides that the outside customer pays for the total cost of water and sewer lines from the nearest point on the city system to a point within reach of his property. He is reimbursed if further connections are made by other property owners. He pays also for the service connections. By formal contract he agrees to pay an annual fee equivalent to what the city property tax would be if the property were inside the city. The property assessment is made by the city assessor. Finally, he pays for water and sewer service at regular city rates. None of these payments entitles the customer to any other city service.

According to Traverse City the plan has been well received by outside residents and provides a better environment in the fringe areas. When annexation is considered, these residents are likely to be in favor since they will automatically qualify for all city services for the same city taxes they are now paying.

Sewer Connections

Connection Fees

Data collected for the *1961 Year Book* show that 75 per cent of the cities over 10,000 population make some type of charge for connecting property to the sewer. An analysis of the provisions of ordinances of 100 of these cities indicates that a variety of factors influence such a charge and that the method of levying the charge also varies greatly. Whereas the experts agree on how sewer service charges should be levied, no such agreement exists on sewer connection charges. The charges of eight cities are described in some detail below to highlight the variety and to illustrate the difficulty in drawing conclusions.

Before discussing connection charges in detail it should be made clear what is meant by the term. For purposes of this report, "connection charge" refers to the connecting of a building, structure, or house to the public sewer in any manner. The distinction is made because some cities refer to both a connection charge and a tap charge. The difference is simply that the tap charge covers the cost of cutting the main sewer and inserting the connection "Y" or "T." Often the "Y" or "T" is inserted in the sewer when it is built. Thus, the connection charge refers to hooking up the building sewer to a "Y" or "T." In cities making this distinction, an applicant might pay only a connection charge if the connecting "Y" or "T" was in place, or both a connecting and tap charge if the "Y" or "T" had to be cut into the sewer.

Reasons for a Connection Charge. There are five basic reasons why a connection charge is made.

First, the city wants to cover the cost of processing the application to connect and any inspections that might be made.

Second, the city often does the actual work of connecting and wants to recoup its expenses. A number of cities make the connection and lay the building sewer to the property or curb line. Some cities make the tap only, requiring the property owner to have the trench excavated and all of the building sewer laid.

Third, the city desires to recover the cost of the sewer or at least a portion of the cost of the sewer. Frequently a city will have sewers that were paid for out of general city revenues and sewers that were paid for, at least in part, by the property owner. To recoup costs of those sewers paid out of city monies, a special connection fee is made. Other cities may initially finance the cost of sewers, but as connections are made, a charge is made. Thus, the city's general extension policy discussed above affects the connection charge. When all sewers are assessed or paid for by the developer, the city's connection charge in most cases is based either on permit issuance and inspection cost or on the cost of labor and materials in making the connection.

Fourth, regulations on street openings will affect the sewer connection charge. If the city does not have an ordinance covering the opening of streets for all purposes, the sewer connection charge will reflect the cost of restoring the pavement or the cost of inspecting the restored pavement when done by private contractors.

The fifth reason for making a sewer connection charge is to reflect benefit received. Such a benefit charge frequently helps to defray future maintenance and replacement costs of the total sewerage system. This type of charge often depends on whether the sewer service charge includes such expenses as depreciation.

Method of Charging for Connections. Cities use several different methods of charging. The flat rate is most frequently used to cover permit and inspection costs, although it is sometimes used to cover the costs of connections.

Units of measures are used. The front footage or area of property is frequently used. Thus before a connection is made a fee of so much per foot must be paid. The number of feet of sewer connection line laid is used to recover the cost to the city of making the connection and of bringing the pipe to the curb or property line. The size of the tap or connection is used to cover the cost of inserting the connecting "Y" or "T" only.

The type of street (concrete, asphalt, gravel) that must be opened to make the connection often determines the cost of a sewer connection. A few cities charge the actual cost of materials plus a percentage for overhead when the city makes the connection. Several cities charge on the basis of the type of building being connected: one-family residence, two-family residence, commercial, and so on.

Determining Connection Charges. Because of the different reasons for levying a connection charge, and the different methods of collecting it, comparisons with other cities are of little help. As illustrated below many cities have a combination of reasons for making sewer connection charges. A city must set its own collection charges based on what it wishes to accomplish: cover the cost of a permit; recoup cost of making connection; recoup cost of the sewer; recoup cost of street repair or regulation; and reflect benefit. More often than not charges will be based on several of these reasons.

Illustrations of Connection Charges

The following cities have been selected to highlight the variety of connection charges and to illustrate the different methods and combinations of methods that exist. The policies represent cities of all sizes.

Los Angeles, California (2,479,015). Los Angeles has a basic charge of \$7.50 to cover the

issuance of a permit and one inspection of the work. If for any reason more than one inspection is required, an additional \$3 per inspection is charged.

The city also makes a charge to recoup the cost of sewers that were not assessed against the property at \$5 per front foot for a normal-sized lot. Adjustments are made for odd-shaped lots. Further, if the connection is to be made to a sewer not assessed, or it is an industrial connection, the permit fee is \$18.

A third type of charge is made when a "Y" or "T" is not available at the place of connection with the lateral sewer. The city then makes the cut in the sewer and charges a flat \$20 for connections with sewers of 18 inches and less, \$39 for sewers over 18 inches, and actual cost if the sewer is in an interceptor constructed of concrete or concrete and brick.

Philadelphia, Pennsylvania (2,002,512). Philadelphia has a flat \$15 charge.

San Diego, California (573,224). San Diego makes almost all connections with city forces. The city installs the building sewer from the sewer to the property line. There is a basic permit fee of \$2.50 plus the following charges: (1) A connection requiring the opening of a street is \$230 for a 4-inch connection not to exceed 40 feet in length from the sewer to the property line. A charge of \$5.75 per foot is made over 40 feet. A 6-inch connection is \$240 plus \$6 per foot over 40 feet. (2) A connection made in an alley is \$115 for a 4-inch building sewer, and \$130 for a 6-inch sewer. For connections over 15 feet the \$5.75 and \$6.00 per foot charge is made. When the connection can be made at the curb the charge is \$90.

Richmond, Virginia (219,958). Richmond's fee schedule illustrates using the size of the building sewer laid and the number of feet laid as units of measures. The city installs all connections from the sewer to the property line. It has a flat rate of \$160 for 6-inch connections. For all connections of a larger size the rate is \$160 plus 16 cents per foot of pipe laid for 8-inch connections, 37 cents per foot for 10-inch connections, 62 cents for 12-inch, 92 cents for 15-inch, and \$1.22 for 18-inch.

Pasadena, California (116,407). Pasadena fees vary. First, all sewer connections requiring street openings must conform to an ordinance regulating street work by private contractor. This ordinance applies to anyone contemplating excavation work and requires a permit fee and a deposit. It is not a sewer connection charge.

Second the city charges \$5 for permission to connect to a sewer at a place where a "Y" or "T" has not been previously installed. Third, there is a charge of \$2 per front foot of the lot or parcel to be connected "if any costs and expenses of the construction of a public sewer is in excess of that portion which the city may have paid under the requirements . . . of the city charter . . . and is in excess of any amount which may have been paid by assessment. . . ."

Wayne, Michigan (16,034). Wayne has two types of fees designated as "tap charge" and "benefit charge." The tap charge includes making the connection and running the sewer main to the property line. For a 6-inch "tap" made in an easement the fee is \$148; \$178 when made in the street or roadway, plus \$50 if a county road with a concrete or black-top pavement is cut. Also an additional fee of \$50 is charged when cutting any pavement of any village street constructed two years prior to making the sewer tap. For all buildings, houses, and structures existing prior to the adoption of the above fee schedule, the \$148 and \$178 charge is reduced to \$98 and \$128 respectively. For all taps over 6 inches, actual cost including overhead is charged plus a sum of \$20.

The "benefit charge" is \$200 for the privilege of connecting to any sewer that was not paid for by a subdivider or special assessment. The charge is payable at the rate of \$2.50 quarterly with the privilege of paying the total sum at any time at a 10 per cent discount. The benefit charge for all sewers constructed by subdividers or by special assessment is \$50.

Springfield, Massachusetts (174,463). Springfield bases its fees upon the type of structure being constructed. Thus it charges \$65 for single-family homes; \$80 for two-family homes; \$90 for three-family homes; and for most other types of buildings, such as apartments, factories, hotels, stores, and office buildings, 3 cents per square foot of building area covered by the two lower stories above ground level, three-fourths of 1 cent per square foot above the first two floors.

Memphis, Tennessee (497,524). Memphis makes a charge based on the type of street involved: \$45 for tar, macadam, and gravel and \$75 for asphalt or concrete.

A Concluding Thought

The review of city practices in financing sewer services shows that cities vary in policies for obtaining revenue. Several forces appear to be at work which will influence cities financing sewer services. Local governments are meeting resistance to property tax increases. Sewage treatment facilities are still not sufficient to stop the polluting of the nation's water resources. Because of need for more facilities, and because city governments do not have unlimited property tax resources, more and more cities will adopt sewer charges, accepting the principle that the sewer system is a utility.

It behooves cities to develop rate schedules, including charges for extensions and connections, that are realistic and equitable. A reading of the policies of a number of cities reporting to MIS indicates that present rates were not based on any concepts or principles but were merely adopted to bring in "x" dollars of revenue. Sewer service charges, extension charges (special assessments), and connection charges should be developed to cover *all* costs of the sewer utility. By all costs is meant operating costs, principle and interest on debt, reserves for depreciation of the disposal plant and other facilities, and reserves for expansion of the system. The general taxpayer should not be required to support a utility operation.

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Appendix A

SANITARY SEWER INSTALLATION POLICIES
Fort Worth, Texas

The following policy shall govern all sanitary sewer installations within the city limits of Fort Worth, Texas:

Definitions

1. The term "single customer" shall apply only to an existing and occupied living establishment or an existing commercial establishment.
2. The term "developer" shall apply to any type of new customer other than a single customer.
3. The "approach main," as it affects a developer, shall be defined as the sewer of sufficient size, usually but not always off the developer's property, which serves the developer's area.
4. "Lateral lines" are defined as those sewers other than approach mains located in streets, alleys or easements, to which house sewers are directly connected, or which serve to convey sewage to another sewer.
5. The term "service line" is defined as that portion of the house sewer located in the roadway between the main or lateral sewer and a point three (3) feet behind the curb line.

Extensions for Single Customers

1. Where it is necessary to extend a sewer line to serve a new "single customer," the City, at its own expense, will extend said sewer up to 100 feet.
2. If a greater distance than 100 feet should be required to extend the line to the nearest property line of the customer, said single customer shall pay the excess over the 100 feet allowable at the rate of \$2.50 per lineal foot.
3. If more than one single customer is served by the main extension, 100 lineal feet of sewer will be allowed for each single customer thus served, and any excess footage will be paid for at the \$2.50 per lineal foot rate.
4. No more than one single customer credit of 100 feet will be allowed for each lot or tract of record so served regardless of the number of buildings, occupied or otherwise, which might be located on said lot or tract.
5. Payment will be made in advance of construction.
6. In the case of older built-up areas where there are numerous prospective single customers, sewer lines will be extended on the 100 foot per single customer basis, provided such customers living within the area group themselves together and act through a committee of not more than five citizens of the area and authorize said committee to carry on in their behalf all negotiations with the City on all matters pertaining to the sanitary sewer installation.
 - a. The City Public Works Department will furnish the necessary plans and perform the engineering work connected with the sewer extension program.
 - b. The committee shall be fully responsible for all contacts with the property owners and for collecting and depositing with the Public Works Department all funds to be paid by the future customers.
 - c. The City at its own expense will extend sewer lines of the proper size 100 feet for each new customer who has met the requirements set forth herein.
 - d. The customers as individuals or as a group shall pay the cost of extending sewer lines in excess of the 100 feet per customer with the pro rata cost to the customers being \$2.50 per lineal foot. No construction shall begin until all monies due have been paid to the City.

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- e. In no case will the City extend its sewerage facilities beyond the last occupied residence or commercial establishment in order to provide service to vacant property.

Extensions to Serve Developers

1. The developer shall pay 75 per cent of the construction cost of all sewers including "approach mains," but excepting "service lines," of sufficient size necessary to serve his addition plus 10 per cent of the developer's share of the construction cost for engineering, supervision and inspection, or six per cent if a private engineer approved by the Director of Public Works is employed by the developer and furnishes approved plans and specifications.
2. The developer will also pay 100 per cent of the cost of "service lines" to all lots to be served by a sewer located in the street. Said "service lines" will be constructed at the same time as a part of the same contract as all other sewers in developer's addition. If the sewers are being constructed by City forces, the "service lines" will be constructed by City forces at the time all other sewers within the addition are constructed.
3. The Public Works Department shall determine the size of "approach main" required to serve developer's property and the actual size to be constructed. Should the City elect to construct a main larger than the developer's required "approach main," the developer will not be charged for the additional size.
4. The amount of developer's payment shall be determined using unit bid prices contained in the award contract.
5. In cases where an oversized "approach main" is constructed and no comparable unit prices are contained in the awarded contract for the size and depth main required to serve only the developer's addition, the Public Works Department shall determine the amount of credit to be allowed the developer as the estimated difference in construction cost between the required approach main and the oversized main designed to handle sewage from other areas in addition to developer's property.
6. The amount of developer's payment for sewers constructed by City forces will be determined from estimates of cost prepared by the Public Works Department.

Engineering and Supervision

1. All sanitary sewer installations shall be in accord with the design criteria developed by the Public Works Department.
 - a. Determination of sanitary sewer facilities required and construction requirements shall be the responsibility of the Public Works Department.
 - b. Where there is a question as to facilities required, it shall be resolved in favor of additional capacity.
 - c. Sanitary sewer mains and laterals shall be located in the streets, except where, in the judgment of the Director of Public Works, topographic conditions make it necessary to locate the sewer in an easement.
2. Plans shall be prepared by the Public Works Department, by engineers employed by the City of Fort Worth, or by engineers employed by the developer and approved by the Public Works Department.
3. Installation of sanitary sewer facilities, including "service lines," shall be by a contract employed by the City of Fort Worth, or by Public Works Department forces.
4. Inspection of all construction work, including "service lines," shall be by the Public Works Department.

Financial Arrangements

1. For projects of considerable size that will be constructed by contract, the developer will

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be informed of the estimated cost and, if agreeable with the developer, the project will be advertised for bids.

2. No work order shall be issued and no construction shall begin until the developer has made the required payment of his construction cost to the City, as set forth in this policy statement. This applies to both work done by contract and work done by Public Works forces.

3. The final construction cost will be determined on the basis of actual quantities installed and unit prices. Refunds will be made to the developer or the developer will make additional payments to the City only when the difference between the contract (or estimated) and actual costs exceed one per cent, or \$25.00, whichever is the larger.

4. If at any time, authorized bond funds that have been allocated by the City Council for developers' projects have been fully committed, the distribution of costs set forth in this policy will be suspended, and all sanitary sewer projects serving newly developed areas will be totally financed by developers. Such suspension of City participation will continue until additional sanitary sewer bonds are authorized, and a portion of these bonds are allocated by the City Council for participation in the cost of developers' projects, and are sold.

Ownership and Maintenance

Title to all sewers constructed by City Forces, except title to "service lines," shall at all times be vested in the City of Fort Worth. Title to all "service lines" built by City shall, after completion be vested in the developer and the City assumes no responsibility for maintenance and operation other than responsibility for its own work and contractors responsibility for materials and workmanship. The portion of the sewerage system where ownership is retained by the City shall be operated and maintained by the City.

Modifying Existing Sewers to Accommodate Building Construction

No building of any kind shall be constructed over an existing sewer main or lateral, unless and until said sanitary sewer has been replaced with either cast iron water pipe or extra heavy cast iron soil pipe, of a type and class specified by the Public Works Department. The work involved in relocating or replacing a sewer line shall be performed by the City, or under City supervision by a contractor employed by the owner and approved by the Director of Public Works. The owner or developer shall without charge to the City convey such additional easements or right-of-way on the property as may be required to accomplish construction of the relocation. The cost of such work shall be borne 100 per cent by the owner of the property.

Effective Date of Policy

This policy shall be placed in effect immediately upon approval by the City Council, and all projects approved by the City Council after that date shall be governed by this new policy.